

Programming 2

Tutorial and Practical 2

This week's tutorial and practical sessions involve creating an object model of a certain scenario, and testing your design by implementing it, and later testing that it works correctly.

Tutorial Session

Scenario

Consider a car's CD audio player. The player includes a stacked cassette of discs, and a player unit that allows the user of the device to add or remove discs from the cassette, skip discs and tracks, as well as play and stop from the current 'place' in the disc cassette.

The task involves designing and implementing an object-based computer model of the CD player, and a simplified simulation of its functionality.

Identifying the Entities

Identify the entities that are present in this scenario, and required for the system to operate properly.

Identifying the Attributes

For each of these entities, what must each contain ("what do they know/hold?") How should these attributes be represented? Are you sure they are placed in the most appropriate object?

Identifying the Methods

What functionality should each of these entities contain? Keep in mind that it must not only have the functionality to perform its own task, but also to properly and appropriately interact with other objects.

Back to the Scenario

Now that a rough picture of the object model has been worked out, look back to the scenario. Will it adequately allow for all of the functionality to be implemented? Run through the various tasks (known as use cases) – does it seem as though anything is missing?

Formalise the Design

With a reasonable degree of certainty that your design is up to the task, ensure that aspects such as visibility and parameter passing are appropriate for the situation.

Laboratory Session

Implementation

From the design discussed and developed in the tutorial, write a simple implementation of the CD player system. Obviously, it will not actually play discs; instead make the system write a message to the screen for when a track is playing.

Testing

Instead of writing a full driver program for the system, write a testing program with hard-coded data and procedures. Construct an instance of the CD player, load it with some sample data, and then try to perform some of the various tasks (remove discs, skip, play).

You may need to test each task in isolation, rather than attempting them all in one test.